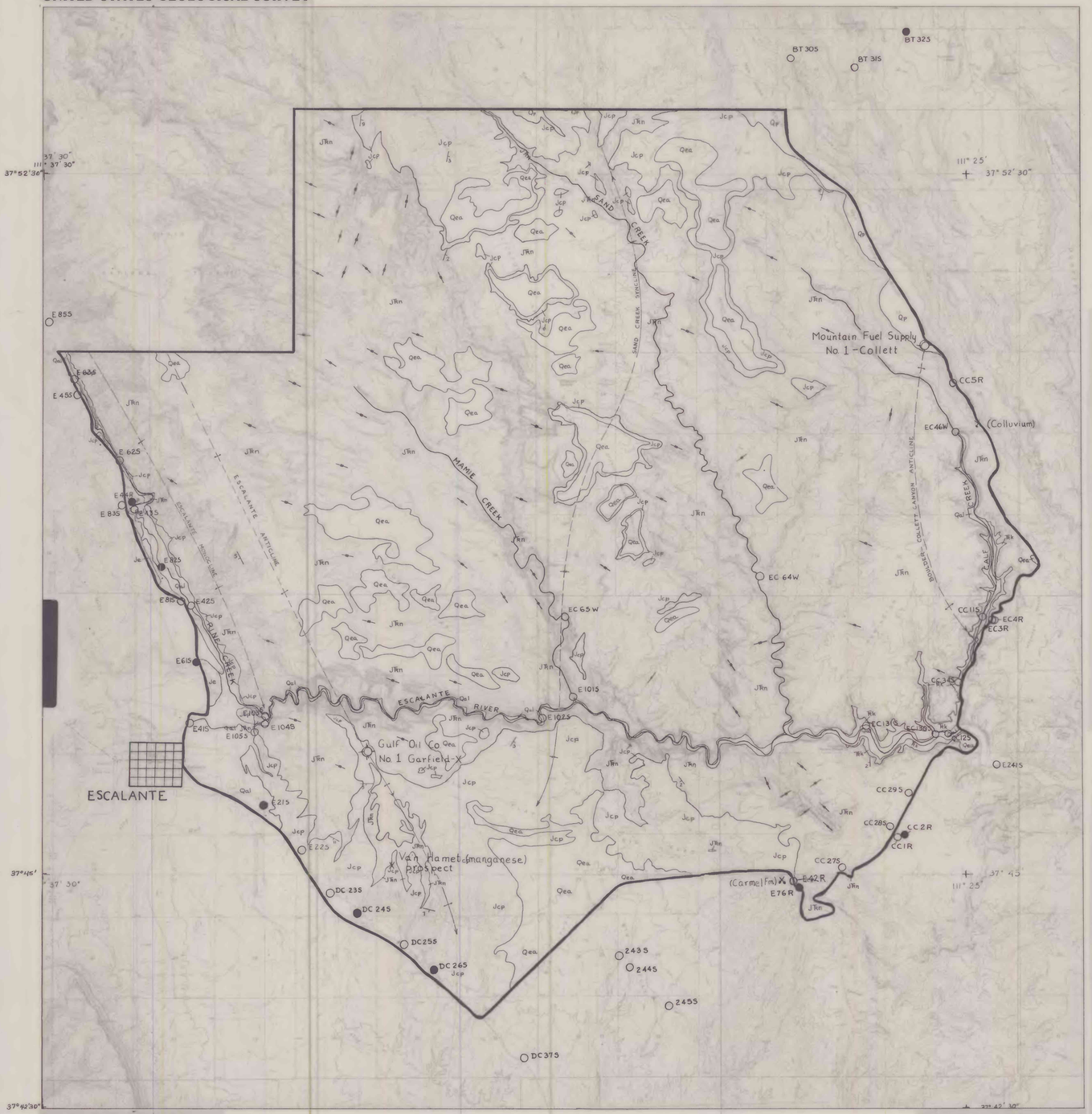
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
81-558



Base from U. S. Geological Survey
Boulder Town, Calf Creek, Tennile Flat, Dave Canyon, Escalante, and Roger Peak, Utah, 1:24,000, 1958

0 1 2 3 MILES
0 1 2 3 4 KILOMETERS

Geology by V. S. Williams, 1978; G. W. Weir and L. Sue Beard, 1980; and H. D. Zeller, 1973

MINERAL RESOURCES OF THE PHIPPS-DEATH HOLLOW INSTANT STUDY AREA, GARFIELD COUNTY, UTAH

By

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1981

LIST OF MAP UNITS

Qal	ALLUVIUM (HOLOCENE)
Qea	EOLIAN AND ALLUVIAL DEPOSITS (HOLOCENE)
Je	ENTRADA SANDSTONE (MIDDLE JURASSIC)
Jcp	CARMEL FORMATION AND PAGE SANDSTONE (MIDDLE JURASSIC)
JRn	NAVAJO SANDSTONE (JURASSIC & TRIASSIC?)
Rk	KAYENTA FORMATION (TRIASSIC)

EXPLANATION

- E1045 — SAMPLE LOCATION AND SAMPLE NUMBER S, stream sediment; R, rock; W, water
- E215 — SAMPLE LOCATION AND SAMPLE NUMBER HAVING ANOMALOUS VALUE (See table 1)
- ANTICLINE--Showing plunge of axis; dashed where approximately located
- PROSPECT (Manganese)
- BORROW PIT
- DRY HOLE
- APPROXIMATE BOUNDARY OF STUDY AREA

INTRODUCTION

The mineral resource potential of the Phipps-Death Hollow Instant Study Area, Garfield County, Utah, is evaluated as low, based on field studies conducted by the U.S. Geological Survey and the U.S. Bureau of Mines during 1979 and 1980.

The Phipps-Death Hollow Instant Study Area includes about 80 sq mi (220 sq km) of mesas and canyons between the towns of Escalante and Boulder in central Garfield County, Utah (fig. 1). The area lies within the western part of the Canyon Lands section of the Colorado Plateau physiographic province (Thornbury, 1965, p. 426-434).

Exploration within the study area has been limited to drilling for oil and gas and prospecting for manganese. In 1979 and 1980 no wells were drilled for oil and gas and the only known manganese prospect was dormant.

GEOCHEMISTRY

Sampling and analytical techniques

A total of 49 samples from within and near the Phipps-Death Hollow Instant Study Area were collected by G. W. Weir, L. S. Beard, and J. C. Antweiler, assisted by Eileen Simmons, M. K. Weisman, and C. A. Worrell. Thirty-eight stream-sediment samples, averaging about one-half pound each, were collected along dry washes and flowing streams tributary of the Escalante River. Eight rock samples were taken as representative of the major formations. In addition, Antweiler collected three water samples from streams in the area.

Semiquantitative spectrographic analyses of the silt fraction (less than 80 mesh) of the stream sediments and rocks were made by D. E. Detra using the six-step method for 30 elements (Au, Ag, As, B, Ba, Be, Bi, Ga, Gd, Co, Cr, Cu, Fe, La, Mg, Mn, Mo, Nb, Ni, Pb, Sb, Sc, Sn, Sr, Ti, V, W, Y, Zn, and Zr). The spectrographic data were reported to the nearest number in the series 1, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1 etc., which represent approximate midpoints of group data on a geometric scale. The water samples were analyzed for uranium by W. L. Campbell using atomic-absorption and liquid-chromatograph techniques. The data for all samples are stored in the Rock Analysis and Storage System files.

Evaluation of analytical data

The analyses of the samples of stream sediments and rocks do not suggest derivation from unmineralized terranes. They appear characteristic of the country rock, mostly sandstone and shale of Jurassic age (Weir and Beard, 1981). A few analytical values seem anomalous (table 1) because they are high relative to the whole set of analyses. Most of the relatively high values in stream sediments are probably related to contamination of fine debris derived from volcanic rocks that crop out north of the study area (McFall and Peterson, 1971). None of the anomalies in the sediments or rocks are extremely high nor do they form a pattern suggesting a need for additional sampling. None of the water samples showed a uranium content of more than 1.1 parts per billion.

Mining districts and mineralized areas

The Phipps-Death Hollow Instant Study Area does not lie within an organized mining district. Mining claim records were examined at the office of the Garfield County Recorder in Utah. No mining claims are known to have been located within the study area.

Development and exploration of mineral resources in and near the study area have been limited to the prospecting for manganese and the quarrying of road material.

The Van Hamet prospect in the southwestern corner of the area is on a small manganese deposit less than 200 ft (60 m) in diameter. Purplish-black manganese minerals are in irregular nodules, from a fraction of an inch to 6 in. (as much as 15 cm) across, scattered through layers less than a foot (30 cm) thick in a lensing sandstone about 6 ft (2 m) thick. The host rock is reddish-brown, fine-grained sandstone in the Judd Hollow Tongue, the basal unit of the Carmel Formation of Middle Jurassic age. Samples of the mineralized material collected by Doelling (1975, p. 138) ranged from 16 to 27 percent manganese and from 45 to 54 percent silica. Such mineralized material, however, is estimated to make up less than 5 percent of the host sandstone.

Road material has been quarried in and near the study area from Quaternary colluvial deposits, consisting mostly of pebbles to boulders of basalt, and from siltstone, shale, and minor sandstone of the lower part of the Carmel Formation of Middle Jurassic age. None of this quarried material has been trucked more than a few miles.

Oil and gas exploration

Two exploratory wells have been drilled in the area for oil and gas in Triassic and Permian rocks. The Gulf Oil Co. No. 1 Garfield-X well tested the Escalante anticline. The Mountain Fuel Supply Co. No. 1-Collett well tested the Boulder-Collett Canyon anticline. Both wells were dry and have been plugged and abandoned. Summary data for these wells are given on table 2.

MINERAL RESOURCE POTENTIAL

The mineral resource potential of the Phipps-Death Hollow Instant Study Area is very low. A single metallic mineral deposit is present. The spectrographic analyses of 46 samples of stream sediments and rocks in and near the study area do not suggest derivation from mineralized terranes. Test wells for oil and gas were dry.

The only known mineral deposit is at the Van Hamet manganese prospect in the southwestern corner of the area (map). The deposit consists of purplish-black manganese minerals in irregular nodular concretions, as much as 6 in. (15 cm) across, in reddish-brown, fine-grained sandstone in the Judd Hollow Tongue of the Carmel Formation. The mineralized material is scattered through layers less than a foot (30 cm) thick in a lensing sandstone about 6 ft (2 m) thick and makes up less than 5 percent of the host sandstone. It lies within an area less than 200 ft (60 m) in diameter. Samples of the mineralized rock, collected by Doelling (1975, p. 138), ranged from about 16 to 27 percent manganese and from 45 to 54 percent silica. The deposit is too small to yield ore in commercial quantities. Furthermore, geologically similar deposits elsewhere in western Utah have not proved economic (Crittenden, 1951, p. 14). Thus, the manganese potential of the area is negligible.

Uranium-copper deposits in Triassic rocks are exposed in the Circle Cliffs area about 10 to 15 mi (16-24 km) east of the study area. The Circle Cliffs deposits are relatively small and weakly mineralized (Davidson, 1965, p. 65-91; Doelling, 1975, p. 107-109, 131-135). The Triassic rocks underlying the area may also be locally uranium- and copper-bearing, but no evidence suggests that they contain economic deposits.

The oil and gas potential appears low, although oil is produced from a fold similar to the Escalante anticline in the Upper Valley field about 12 mi (20 km) southwest of the study area. The productive strata are in the Timpoweap Member of the Moenkopi Formation (Triassic) and the Kaibab Limestone (Permian). Shows of oil have also been noted in the upper part of the Moenkopi, in the Cedar Mesa Sandstone Member of the Cutler Formation (Permian), and in the Redwall Limestone of Mississippian age (Peterson, 1973; Doelling, 1975, p. 91-96). The Escalante anticline was tested in the area by the Gulf Oil Co. No. 1 Garfield-X well in 1972 (map). According to records of the Conservation Division of the U.S. Geological Survey, the well penetrated the Moenkopi and Kaibab and bottomed in the Cedar Mesa Sandstone Member of the Cutler Formation (Permian) at a depth of 4,399 ft (1,340 m) with no recorded shows of oil or gas. Three other tests of the Moenkopi and Kaibab drilled on the Escalante anticline, 8-10 mi (13-16 km) north of the area, were also dry wells. The Boulder-Collett Canyon anticline was tested in 1969 by the Mountain Fuel Supply Co. No. 1-Collett well near the northeast edge of the area. The well, which was dry, bottomed below the Kaibab in the White Rim Member of the Cutler Formation (Permian) at a depth of 3,225 ft (973 m). Six other tests on this anticline outside the study area, 6-12 mi (10-20 km) south of the Mountain Fuel Supply Co. well, were also unsuccessful, though one well 6 mi (10 km) to the south had a show of oil in Permian strata.

Potential construction materials within the area include gravel in Quaternary alluvial and colluvial deposits, and gypsum and limestone in the Carmel Formation. These materials are, however, not economically significant, because ample supplies are readily available at nearby localities outside the study area.

REFERENCES

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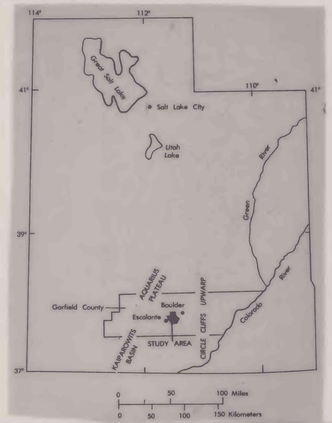

Figure 1.--Index showing location of the Phipps-Death Hollow Instant Study Area, Utah

Table 1.--Anomalous values shown by semiquantitative spectrographic analyses of stream sediments and rocks in and near the Phipps-Death Hollow Instant Study Area, Utah

[Samples analyzed by D. E. Detra, using the six-step method for 30 elements. Values reported in parts per million (ppm); (---), no data found]

Sample No.	Element (Lower limit of detection) Anomaly minimum						Remarks
	As (200) 200	Cr (10) 100	Cu (20) 100	Pb (10) 100	Sr (100) 500	V (10) 100	
CC2R	700	---					White ss; Navajo ss.
E21S		150					Stream sediment, tributary to Alvey Wash
DC24S			100				
DC26S				100			
BT32S		100			500	300	Stream sediment, tributary to Boulder Cr.
E44R					1,000		Gypsum, Carmel Fm.
E61S					500		Stream sediment, tributary to Pine Cr.
E76R		150					Cgl ss, Harris Wash Tongue, Page ss.
E82S		100					Stream sediment, tributary to Pine Cr.

Mineral Surveys

Wilderness Studies Related to Bureau of Land Management

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976), requires the U. S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Phipps-Death Hollow Instant Study Area, Utah.